

playing at other positions but should not pitch again until the epiphyses close. Coaches and supervisors should be educated that elbow pain in youngsters is due to epiphysitis and they should not recommend treatment techniques commonly used for adult pitching arms.

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Hand and Foot Problems in Drug Users

COMPLICATIONS with the injection of drugs into the extremities have increased epidemically. The magnitude of complication ranges from cellulitis to gas gangrene. The most serious complications in the extremities have occurred following inadvertent introduction of particulate matter into the arteries of the limbs. They vary according to the agent, amount, site of introduction, filler-substances, and delay in treatment.

Historically, intra-arterial injections of drugs have been a complication of drug administration for anesthesia or radiography. Now drug users who are "mainlining" sometimes inadvertently inject drugs into an artery and need emergency medical treatment.

The severity of disease is determined by vascular spasm, thrombosis, and ischemia. Tissue necrosis occurs as a consequence of intimal necrosis, vascular obstruction, and infection. Vascular involvement of the lower extremities is more commonly associated with amputation.

The syndrome of accidental arterial injections is one of immediate severe burning pain along the distribution of the vessel injected. The sensation is referred to as a "hand trip." The pain begins in the fingertips and extends proximally to the site of injection. The signs of ischemia are blanching of the tips of the digits, and the nailbeds soon appear cyanotic. A peripheral pulse may or may not be present.

The early inflammatory signs may progress rapidly to extensive swelling and discoloration of the limb. With treatment the symptoms may subside or progress to tissue necrosis and gangrene.

A high index of suspicion of drug abuse must be maintained. Treatment must be prompt. The

most important aspect of treatment is heparinization to prevent thrombosis. The limb should be elevated slightly to improve venous drainage but not so much as to restrict arterial flow. The use of intra-arterial vasodilators, high molecular weight dextran, sympathetic blocking agents, and oxygen to increase the PO₂ of arterial blood has been advocated. There has been disagreement as to the efficacy of some of the above agents. The use of papaverine, topical anesthetic, and sympathectomy has not been universally effective.

Fasciotomy may limit the extent of ischemic muscle contracture. Amputation has been required in a large number of cases.

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Chymopapain Chemonucleolysis

CHYMOPAPAIN is the major proteolytic enzyme in papaya latex. It was first used for lysis of the nucleus pulposus of human discs in 1963. The pharmacologic action of chymopapain is on the non-collagenous protein interconnecting molecules of long-chain mucopolysaccharides causing dissolution of the bonds. The absence of effect on collagen assures that the annulus and the dural sac serve as effective barriers to indiscriminate digestion of other tissues. The enzyme has no direct effect on neural tissue, but inadvertent subarachnoid injection causes major hemorrhage and even death in experimental animals.

The indications are identical to those for classical laminectomy and discectomy. No effect would be expected in patients with spatial compromise due to causes other than disc degeneration or rupture.

Chemonucleolysis is performed under general anesthesia with bi-planar image intensifier control. The injection is made by the right lateral approach to avoid the subarachnoid space.

Several investigators have reported results similar to ours: 76.3 percent of our 422 patients had some degree of symptomatic improvement; in 32 percent results were rated excellent (pain-free and normally active for age).

The major complication has been anaphylac-